ELECTRONIC COMMERCE SYSTEM AND METHOD

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an electronic commerce system utilizing communication networks, and more particularly, to an electronic commerce system for presenting combinations of items for sale.

Description of the Related Art

Recently, with advances in the infrastructure for communication networks such as the internet, electronic commerce (hereinafter referred to as e-commerce) utilizing the communication networks has expanded.

As is known, a product may exhibit a newly added value when sold in combination with other products. In the specification of the present invention, the term "item" refers to a product in a combination of such products that exhibit the newly added value when combined. For example, fashion goods or furniture are often sold in combinations. A consumer may be motivated to purchase an item as part of a combination with other items. That is, in products such as fashion goods and furniture, a specific value may be added when products offered for sale are combined.

However, e-commerce that only presents each item individually does not sufficiently cope with sales of items such as fashion goods which exhibit specific

characteristics and various values when offered in a combination.

For example, when a consumer wants to purchase pants that match well with a wonderful sweater, in conventional store sales, the consumer searches and tries on a range of items limited to those items displayed in the store.

However, in an e-commerce system that offers various products for sale, a consumer needs to find a desired item from a list with a huge number of items. Further, it is not easy to use an information terminal to present elements such as colors and touch to the consumer, though such elements are important in choosing an item. Therefore, it is difficult for the consumer to choose an item that really satisfies her/his requirements.

There is thus a problem that conventional e-commerce systems are not able to sufficiently offer items in a desired combination, such as sales of fashion goods.

Further, there is known a method for presenting to consumers a database of combinations of items formed by experts. However, there is a low probability that individual preferences of a consumer matches those of a specific expert for items in which individual preferences are important such as fashion goods. Rather, it is common for a consumer to buy a casual item at a store A and to buy a sophisticated item at another store B or C. The stores A-C may offer items selected by professionals. Thus, the preference of a consumer is

generally represented by a complicated combination of scenes and experts. Therefore, an e-commerce system using only the database of combinations of items formed by experts does not satisfy requirements of consumers with respect to items for which a combination is important, such as clothes. In the e-commerce system that is not able to cope with preferences of consumers sufficiently, there is a problem that a rate of returned items is not negligible and must be factored into considerations of costs.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an e-commerce system capable of presenting combinations of appropriate items matching with a preference of a consumer, even when the consumer is not able to obtain sufficiently detailed information on the items, and thereby enabling a rate of returned items to be decreased.

That is, in the e-commerce system of the present invention, a seller registers items with an item database. Based on registered items, a coordinator coordinates combinations of the items and stores the combinations of the items in a coordination database. The coordination database is opened to the public for consumers to place orders, and after a transaction is completed, payments are received from an account of a corresponding consumer and made to the seller. It is thereby possible to present

combinations of items coordinated by coordinators with detailed knowledge, sophisticated sensitivity and high skills to consumers who do not have detailed knowledge of the registered items. Accordingly, choosing and purchasing from among the combinations is highly satisfying to consumers. As a result, it is possible to decrease a rate of returned items. In addition, the coordinators are not limited to persons having sophisticated specific knowledge and skills, and it may be possible for ordinary persons to join as the coordinators.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects and features of the invention will appear more fully hereinafter from a consideration of the following description taken in connection with the accompanying drawings wherein one embodiment is illustrated by way of example, in which;

FIG.1 is a block diagram of an e-commerce system according to one embodiment of the present invention;

FIG.2 is a diagram illustrating an exemplary structure of a screen for use in registering coordination data;

FIG.3 is a diagram illustrating an exemplary structure of a learning and ordering screen displaying a list of model pictures;

FIG.4 is a block diagram of an information filtering

section of a virtual coordinator in the e-commerce system; and

FIG.5 is a diagram illustrating an exemplary structure of an ordering screen for use in inputting ordering data.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of an e-commerce system of the present invention will be described specifically below with reference to accompanying drawings. In addition, while this embodiment describes the e-commerce system dealing in fashion items, items subject to the present invention are not limited to fashion items.

FIG.1 is a block diagram of the e-commerce system according to this embodiment. A seller(s) that sells fashion items accesses the e-commerce system via seller interface 1. Item data regarding items input by the seller via seller interface 1 is registered with item database 2. The items that the seller handles are stored in item database 2 as data of the database, and include characteristics of the items such as a color and touch.

Settlement person 3 clears up transactions. Settlement person 3 displays concepts to coordinate fashion items (hereinafter referred to as coordination concepts) on concept board 4. In addition, a person who displays the coordination concept on concept board 4 is

not limited to settlement person 3, and it may be possible to receive any concept from any person such as a consumer, coordinator or seller to display.

The coordinator reads necessary information from item database 2 and concept board 4 to coordinate the items. The coordinator accesses the item database 2 and concept board 4 using coordinator interface 5. Keywords to represent an image of a combination of coordinated items are stored in image-word database 6, and combinations of items are stored in coordination database 7.

A consumer who purchases a fashion item accesses the e-commerce system via consumer interface 8. The consumer inputs data for fitting the fashion item, such as the height of the consumer, via consumer interface 8, and the data is stored in fitting database 9. At least one virtual coordinator 10 is assigned to the consumer. Virtual coordinator 10 retrieves combinations of items from coordination database 7 according to requirements of the consumer. Then virtual coordinator 10 places an order with settlement person 3 for the item that the consumer purchases. The orders for items from settlement person 3 to the seller are stored in consumer database 11 for each consumer. The item shipped from the seller receiving the corresponding order is sent to the consumer via shipping processing section 12 under control of the e-commerce system. Shipping processing section 12

acquires information for shipping from settlement person 3.

Meanwhile, the consumer receives an ordered and sent item which may be returned if it does not interest the consumer. The returned item is sent to the seller via return processing section 13 under control of the e-commerce system. Return processing section 13 acquires information for the returned item from settlement person 3.

Seller authentication section 21 authenticates the seller and communicates with an account of the seller. Further, coordinator authentication section 22 authenticates the coordinator and communicates with an account of the coordinator and the like. Furthermore, consumer authentication section 23 authenticates the consumer and communicates with an account of the consumer.

In addition, the e-commerce system as described above is constructed with computers or a computer system. Further, seller interface 1, coordinator interface 5 and consumer interface 8 are each constructed with a computer which has installed browsing software such as an internet browser which is accessible to the e-commerce system via communication networks.

Moreover, it may be possible to open item database 2 and concept board 4 to the public on a web server to enable anyone to register an item and/or concept after registering with the e-commerce system.

In this case, it is possible to receive offers of items from manufactures all over the world as well as specific sellers, thereby expanding a range of coordination. Further, a coordinator is able to coordinate and provide item combinations. Meanwhile, a consumer is able to receive presentations of the item combinations from coordinators in accordance with concepts matching with the consumer's preference. Furthermore, a seller is able to propose the coordination with concepts using items that the seller sells.

The operation of the e-commerce system constructed as described above is explained below. A seller accesses seller authentication section 21 via seller interface 1. The seller performs registration processing with the e-commerce system when necessary, and is provided with authentication information to access to the system. The seller registers item data, in which items (clothes) that the seller wants to sell are described, with item database 2 via seller interface 1. Preferable item data includes a picture, type (such as a jacket, straight pants or long skirt), color, material (such as cotton or wool), yarn size, weave, maker's name, and price of the item. A homepage managed by the e-commerce system on the internet provides the registration service for registering the item data with item database 2. The items registered with item database 2 are assigned respective item identification numbers.

Settlement person 3 displays a plurality of coordination concepts to coordinate fashion on concept board 4. For example, settlement person 3 displays a concept having contents indicative of "casual dress vivid in winter scenery" on concept board 4.

A coordinator accesses coordinator authentication section 22 via coordinator interface 5. Then, the coordinator performs registration processing with the e-commerce system when necessary, and is provided with the authentication to access to the system. Further, the coordinator reads the coordination concepts displayed on concept board 4 via coordinator interface 5. Then, the coordinator reads item data suitable for the concepts from item database 2, and coordinates the items such as a jacket and pants according to the coordinator's taste. It is preferable to enable the coordinator to coordinate using only a portion of item data (for example, picture of an item). After finishing the combination of items, the coordinator selects "keyword(s)" representing an image of the combination of items from image-word database 6. Then, the coordinator registers the combination of items as well as the keywords with the coordination database 7 as coordination data. Preferable coordination data includes registered date, picture of a model with the items combined by the coordinator (hereinafter referred to as a model picture), coordinator identification name, keyword(s), coordination concept,

and item data. In addition, a computer graphics may be available as the model picture. It is further preferable to enable the coordinator to add new "keyword(s)" to image-word database 6.

FIG.2 is an exemplary structure of a registration screen for use by the coordinator in registering the coordination data with coordination database 7. The registration screen is composed of a model picture input frame, image-word input frame, item data input frame, fitting data input frame and coordination database registering button. The registration screen is formed of a structured document with HTML, and is transferred to coordinator interface 5 by accessing concept board 4 and clicking a desired coordination concept. The coordination database registering button is linked with a registration execution file for registering the coordination data with coordination database 7.

When the coordination database registering button is clicked, data input to each input frame, coordinator identification name and coordination concept identification number are transferred to the e-commerce system from coordinator interface 5 with HTTP (Hyper Text Transfer Protocol) as well as a coordination registration request.

Repeating the above procedures stores a plurality of coordination data in coordination database 7. It is preferable in this embodiment to arrange the plurality

of coordination data for each coordination concept displayed on concept board 4.

A consumer who wants to purchase a fashion item first accesses consumer authentication section 23 via communication networks using consumer interface 8. Then, the consumer registers to be a purchaser. In the preferable registration procedure, whether or not the consumer is allowed to register is judged using information indicative of reliability of the consumer. For example, the consumer authentication section 23 may utilize a credit card number and account number of the consumer. After being authorized to register, the registration procedure is performed for the consumer to be the purchaser. In addition, it may be possible to perform the registration procedure for a consumer at the time the consumer purchases an item.

When the registration for the consumer is allowed, consumer authentication section 23 assigns at least one virtual coordinator 10 to the consumer. It may be possible to assign multiple virtual coordinators 10 for other people such as a child or husband/wife. Selection criterions are absolutely different when the consumer purchases her/his own goods in comparison to when the consumer purchases goods for other people (child, husband/wife). As described later, since virtual coordinators 10 present ordered combinations of items suitable for individual taste, it is necessary to

coordinate virtually according to individual taste and preference.

Virtual coordinator 10 accesses coordination database 7 to read the coordination data. Then, virtual coordinator 10 presents appropriate coordination concepts for the consumer interface 8 being used by the consumer.

The consumer selects a coordination concept among the coordination concepts displayed on consumer interface 8. When the consumer selects the coordination concept, virtual coordinator 10 selects coordination data associated with the selected coordination concept from the coordination data stored in coordination database 7. Then, the virtual coordinator 10 transmits the learning and ordering screen, composed of a list of model pictures contained in the selected coordination data, to consumer interface 8. When the number of model pictures is large, the learning and ordering screen is composed of a plurality of pages.

FIG.3 is an exemplary structure of the learning and ordering screen displayed on consumer interface 8. As illustrated in FIG.3, the learning and ordering screen is comprised of a plurality of model pictures, buttons (shown with "□" and "×") for inputting whether a consumer is interested in respective pictures, and learning buttons. It is preferable to present prices (sum of total cost of items, coordination fee, expenses and benefit) on the

learning and ordering screen. Further, it is preferable to display to a newly-registered consumer whose preference is not recognized at least one model picture for each coordinator who has registered coordination data. Combinations of items proposed by each coordinator depend on the taste of the coordinator. There is a strong tendency that a consumer purchases goods of a coordinator whose taste the consumer favors. Meanwhile, there is a limitation on model pictures for which a consumer inputs an interest on the learning and ordering screen. Accordingly, at the stage of learning, displaying model pictures proposed by as many coordinators as possible on the learning and ordering screen is extremely important from a point of view of accurately grasping the preference and taste of a consumer.

The consumer watches model pictures displayed on consumer interface 8, and inputs whether each of the pictures matches with her/his preference using a respective button. Based on each model picture, i.e., each coordination data and an input indicative of the preference of the consumer, virtual coordinator 10 learns a tendency of the preference of the consumer. It is preferable that the learning is performed when a consumer presses a learning button.

When the learning button is pressed, virtual coordinator 10 rearranges and displays again the model pictures in descending order of consumer's interest

according to information filtering described later. Information is filtered with respect to coordination data groups of the coordination concept that the consumer selects.

The information filtering is explained herein according to which model pictures are rearranged in descending order of consumer's interest. A relationship is acquired between a coordinator identification name, keyword(s) and item data assigned to each coordination data, and preference of a consumer. Then, the degree to which the consumer is interested in each coordination data stored in coordination database 7 is predicted with a signal having a numerical value. It is thereby possible to represent the preference of the consumer with a plurality of coordinator identification names and keywords, and a plurality of coordinator identification names and item data, as well as other combinations of information, enabling the preference of the consumer to be precisely represented.

FIG.4 is a block diagram of sections associated with the information filtering by virtual coordinator 10. A model picture of coordination data to be evaluated is input to information data input terminal 100. Further, a number-of-keyword signal indicative of the number of keywords contained in the above coordination data is input to number-of-keyword signal input terminal 101. Furthermore, a keyword group signal composed of a

plurality of keywords is input to keyword signal input terminal 102. The keyword group signal includes image keywords, item data and a coordinator identification name of the model picture contained in the coordinate data.

Vector generating section 103 transforms character sequences from a keyword group signal to a vector signal V. In order to transform the character sequences to the vector signal V, a character sequence of a code dictionary signal stored in code dictionary storage section 104 is employed. Code dictionary storage section 104 stores character sequences of coordinator identification names, image keywords, item data and the like each in a form of the code dictionary signal. When the same character sequence as a character sequence of a jth code dictionary signal is detected from the keyword group signal, "1" is input to a jth vector component of the vector signal V. When the same character sequence as the character sequence of the jth code dictionary signal is not detected, "0" is input to the jth vector component of the vector signal V. Similar processing is repeated with respect to all the components of the vector signal V.

Positive signal calculating section 105 calculates, using a positive metric signal, a positive signal SY such that a value thereof is large when the keyword group signal contains a large number of keywords that interested the consumer according to the consumer's previous replies. Negative signal calculating section 106 calculates, using

a negative metric signal, a negative signal SN such that a value thereof is large when the keyword group signal contains a large number of keywords that did not interest the consumer according to the consumer's previous replies. The positive metric signal stored in positive metric storage section 107 is determined based on the keyword group signal and a reply indicating that the consumer has an interest. The negative metric signal stored in negative metric storage section 108 is determined based on the keyword group signal and a reply indicating that the consumer has no interest.

Using the positive signal SY and negative signal SN, necessity calculating section 109 calculates a necessity signal N according to an equation of N=SY-C□SN and further calculates a reliability signal R according to another equation of R=C□SY+SN. The necessity signal N has a large value when there are a large number of keywords contained in the coordination data (model picture) that previously interested the consumer, and there are few keywords contained in the coordination data (model picture) that previously did not interest the consumer. The coefficient C is used to separate model pictures that the consumer is interested in and model pictures that the consumer is not interested in. The coefficient C is stored in determination parameter storage section 110.

Coordination data write control section 111 decides the order of evaluated coordination data and writes the

ordered coordination data in coordination data storage section 112. Coordination data storage section 112 stores the coordination data arranged in descending order of necessity signal value.

At a stage that the learning is not performed, since the necessity signal N and reliability signal R are not calculated, a plurality of coordination data contained in the coordination concept designated by the consumer is written in coordination data storage section 112 without deciding the order. The learning and ordering screen illustrated in FIG.3 is generated using model pictures of the plurality of coordination data written in the section 112. It is preferable to generate the learning and ordering screen with a structured document using HTML. The learning buttons are linked with a learning execution file. When the learning button is clicked, a learning request and the consumer input data indicative of whether the model picture interests the consumer is collected and transferred to the learning execution file of virtual coordinator 10.

After the coordination data is written in coordination data storage section 112, a signal for starting virtual coordination is input to coordination data output control section 114 via virtual coordination start signal input terminal 113.

Coordination data output control section 114 generates the learning and ordering screen using the model

pictures of the coordinate data. Then, the section 114 transfers the learning and ordering screen from coordination data output terminal 115 to consumer interface 8 via communication networks. It may be possible to use HTTP to transfer the structured document of the learning and ordering screen from the e-commerce system to consumer interface 8.

The structured document of the learning and ordering screen in FIG.3 is displayed on a display of consumer interface 8. A consumer clicks a button of interest (or disinterest) in each model picture to input a reply for the picture on consumer interface 8. When the learning button is clicked, the learning request and data (hereinafter referred to as learning signal) indicative of interest (or disinterest) in the model picture are returned to virtual coordinator 10 via communication networks. The learning execution file is thereby started. The learning execution file manages learning processing described later.

When virtual coordinator 10 receives the learning request transmitted from consumer interface 8, the coordinator 10 fetches a teaching signal T that is transmitted along with the learning request. The teaching signal for each model picture displayed on the learning and ordering screen is stored in teaching data storage section 117 via coordination data output control section 114. Each teaching signal T is stored with a

keyword group signal and number-of-keyword signal, each corresponding to the signal T in teaching data storage section 117.

After the data necessary for the learning is stored in teaching data storage section 117, a learning start signal is input to learning start signal input terminal 118. When the learning start signal is input, learning control section 119 turns on switches 122, 123 and 124 to connect metric learning section 120 and learning vector generating section 121.

Metric learning section 120 fetches the teaching signal T, the keyword group signal and the number-of-keyword signal from teaching data storage section 117, and inputs the keyword group signal and number-of-keyword signal to learning vector generating section 121. Learning vector generating section 121 transforms the keyword group signal to a learning vector signal LV using the code dictionary signal as well as vector generating section 103. The positive metric signal is corrected based on the learning vector signal LV corresponding to the teaching signal T which indicates interest. Meanwhile, the negative metric signal is corrected based on the learning vector signal LV corresponding to the teaching signal T which indicates disinterest.

The positive metric signal thereby has a large value with respect to the keywords (coordinator identification

name, item data, image keyword and so on) included in the coordination (model picture) data that interests the consumer. Similarly, the negative metric signal thereby has a large value with respect to the keywords (coordinator identification name, item data, image keyword and so on) included in the coordination (model picture) data that does not interest the consumer.

Learning score calculating section 125 operates in a similar way to positive signal calculating section 105 (negative signal calculating section 106), and thereby calculates a learning positive signal LSY and a learning negative signal LSN from the learning vector signal LV. Using the learning positive signal LSY and learning negative signal LSN, determination plane learning section 126 obtains the coefficient C that most accurately separates model pictures that interest the consumer and model pictures that do not interest the consumer. The coefficient C is expressed on a two-dimensional space using the positive signal SY and negative signal SN. The coefficient C is stored in determination parameter storage section 110. When the learning is finished, learning control section 119 outputs a learning finish signal from learning finish signal output terminal 127.

After confirming that the learning finish signal is output, coordination data write control section 111 again inputs each model picture, and the keyword group signal and number-of-keyword signal are each assigned

to the model picture stored in coordination data storage section 112 for respective input terminals 100, 101 and 102. As a result, with respect to each model picture, the necessity signal is calculated which accurately reflects interests (preference and taste) of the consumer based on the keywords assigned to the model picture. The model pictures are rearranged in descending order of the necessity signal, and the ordered pictures are again stored in coordination data storage section 112. Coordination data output control section 114 fetches model pictures from the coordinator data rearranged in descending order of the necessity signal, and generates the learning and ordering screen with the model pictures rearranged in descending order of the necessity signal. The section 114 transfers the generated screen to consumer interface 8 to display again.

The consumer looks at the rearranged model pictures, and retrieves a model picture (combination of items) matching with the consumer's preference. In addition, the consumer inputs the preference again when necessary. Repeating the processing, i.e., only inputting whether the picture matches with the consumer's preference, enables the consumer to obtain a combination of fashion items matching with the consumer's preference.

In addition, it is also possible to rearrange the coordination data using the above-mentioned information filtering to display when the consumer changes the

coordination concept during the retrieval.

When the consumer finds out the combination of fashion items matching with the consumer's preference, she/he places an order for the combination of items. In the e-commerce system, when the model picture corresponding to the combination is clicked, an ordering screen as illustrated in FIG. 5 is displayed on the consumer interface. Displayed at the upper left of the ordering screen illustrated in FIG. 5 is the model picture of the selected coordination data. Further displayed at the upper right is the fitting data input frame for use in inputting data necessary for choosing a size of a clothing item. Furthermore, under the fitting data input frame is a frame for displaying a list of the items contained in the selected coordination data. In the list, a check button is provided for each item to designate an item for which the order is placed. The consumer selects one or more items with the check buttons, and presses an ordering button.

In addition, it is preferable to provide the list at its beginning with a field of "set of coordination" (coordinated list of items) for use in placing an order for all the items one time. In this case, it is possible to place an order for the combination of coordinated items collectively, thereby enabling simplified order processing.

After confirming that the ordering button is pressed,

virtual coordinator 10 sends ordering data to settlement person 3, and then writes the fitting data in fitting database 9.

Settlement person 3 checks a payment ability of the consumer, for example, using a credit card of the consumer. Then, the person 3 sends an item ordering request and an item identification number to the seller via seller authentication section 21, while sending data of the consumer and the item identification number to shipping processing section 12.

When the seller receives the item ordering request, the seller sends the item to shipping processing section 12 of the e-commerce system.

When shipping processing section 12 receives the item, the section 12 searches item identification numbers stored therein for an item identification number corresponding with that attached to the item. Then, the section 12 reads the data of the consumer that places an order for the item designated with the item identification number, and ships the item to the consumer. At this point, the section 12 sends the item identification number and the data of the consumer to return processing section 13.

The consumer receives the item. When the consumer wants to return the item, she/he returns the item to the e-commerce system within a predetermined period.

When return processing section 13 does not receive

a returned item in the predetermined period starting from the time of receiving the item identification number from shipping processing section 13, the section 13 transmits a signal indicating the item identification number and that the item is not returned to settlement person 3.

Settlement person 3 who receives the signal indicating the item identification number and that the item is not returned performs a procedure for settling a payment of the corresponding item via consumer authentication section 23. Then, settlement person 3 pays the charge to the seller who sells the ordered item, while paying the coordination charge to the coordinator who generates the coordination data used in the order. Further, settlement person 3 stores data concerning the item in consumer database 11.

When return processing section 13 receives the returned item in the predetermined period starting from the time of receiving the item identification number from shipping processing section 12, the section 13 returns the item to the seller, while transmitting a signal indicating the item identification number and that the item is returned to settlement person 3.

When settlement person 3 receives the signal indicating the item identification number and that the item is returned, the person 3 transmits a signal indicating that the item is returned and the coordination data indicating the combination of items to virtual

coordinator 10 of the consumer.

The information of the consumer returning the item is indicative that the returned item, which is judged to match with the preference of the consumer at the time of placing its order, actually does not match with the preference of the consumer. Therefore, virtual coordinator 10 rewrites data to indicate that the item does not match with the preference of the consumer with respect to the coordinate data. Then, virtual coordinator 10 stores return data concerning the item in consumer database 11.

Thus information on an item returned from a consumer enables consideration of the item actually shipped to the consumer and then returned. It is thereby possible to retrieve coordination data matching with the preference of the consumer.

When the consumer later uses virtual coordinator 10, virtual coordinator 10 preferentially presents to the consumer the coordination data expected to match with the preference of the consumer using the information filtering with the preference of the consumer stored previously.

In the embodiment as described above, virtual coordinator 10 decides the order of a plurality of items of coordination data contained in a coordination concept designated by a consumer based on the reply of the consumer, however, it may be possible to present those in turn without

deciding the order. Also in this case, it is possible for a consumer to select from combinations coordinated by an expert (coordinator) having sufficiently detailed knowledge on items even without the order being decided by virtual coordinator 10. Therefore, it is possible for the consumer to find an appropriate combination of items matching with the preference and taste of the consumer among huge amounts of information even when the consumer is not able to obtain sufficiently detailed information on the items.

According to the present invention as described in detail above, it is possible to present appropriate combinations of items matching with the preference and taste of a consumer even when the consumer is not able to obtain sufficiently detailed information on the items, and as a result to provide an e-commerce system which achieves a decreased rate of returned items.

The present invention is not limited to the above described embodiments, and various variations and modifications may be possible without departing from the scope of the present invention.

This application is based on the Japanese Patent Application No.HEI11-362521 filed on December 21, 1999, entire content of which is expressly incorporated by reference herein.